HEALTH

Food vs. Pills

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Quick Facts...

Healthy people can obtain all the vitamins and minerals they need from eating a variety of foods.

Taking supplements does not guarantee protection against disease.

Large doses of either single-nutrient supplements or high potency vitamin-mineral combinations may be harmful.

Vitamin deficiency is rare unless a person's diet is limited and lacks variety.

Do not take self-prescribed single nutrient supplements without first consulting a physician or registered dietitian.

Can Food Give Us All the Nutrients We Need?

About 68 percent of American adults take a multivitamin supplement each day because they think the food they eat lacks needed nutrients. With the quality and variety of food available in the United States, however, healthy people can get the vitamins and minerals they need from food. For a better understanding of how to choose foods that provide the daily requirements for nutrients see *A Guide For Daily Food Choices* (www.ext.colostate.edu/pubs/foodnut/09306.html).

Our food supply provides a unique balance that cannot be duplicated by taking any combination of supplements. In addition, eating is one of life's pleasures. However, it is evident by supplement sales totaling over $23.7 billion a year that much is invested in the hope that supplements will help.

The Value of Supplements

- **Myth:** People can eat whatever they want as long as they take vitamin and mineral supplements.
- **Fact:** Supplements supply some vitamins and minerals, but they do not provide all of the components of food necessary for good health. We need 42 nutrients each day. Supplements supply only a fraction of these and are not a quick fix for poor food choices. Additionally, fruits and vegetables have additional nutrients that are beneficial for health known as phytochemicals. While some phytochemicals may individually be found in supplement form, a single serving of fruits or vegetables can provide a much higher number of these nutrients in an all natural form.
- **Myth:** People need vitamin and mineral supplements to ensure good nutrition.
- **Fact:** Supplements are not needed if a variety of foods are eaten. Taking in more nutrients than the body needs does not give added energy, more brain power or greater protection against disease. High intakes of certain vitamins and minerals can even be toxic.

Types of Supplements

- **Myth:** Natural vitamins are better for you than synthetic vitamins.
- **Fact:** The body treats most natural supplements the same as synthetic vitamins.
- **Myth:** Supplements with added enzymes are easier to digest.
- **Fact:** Supplements with added enzymes to aid digestion are unnecessary. The body makes its own digestive enzymes. However lactase enzymes do assist those who have lactose intolerance.

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- **Myth:** Timed-release supplements help absorption.
- **Fact:** Actually, timed-release supplements are absorbed less efficiently than tablets, chewables or solutions.

Can Vitamins and Mineral Supplements Promote Health and Prevent Disease?

Vitamins and minerals will prevent diseases associated with nutritional deficiencies such as scurvy, beriberi, pellagra and rickets. These diseases, however, are rare in the United States because the foods we eat are good sources of the needed nutrients.

The diseases that plague today's Americans are chronic diseases not caused by specific nutrient deficiencies. Heart disease, cancer, diabetes and high blood pressure are affected by many factors, one of which is eating patterns. If people eat a variety of foods in adequate and moderate amounts, supplements will not give added protection.

- **Myth:** Taking supplements that contain antioxidants such as vitamins A and C, beta carotene, vitamin E or selenium will prevent cancer.
- **Fact:** Research from a decade ago suggested that taking antioxidant supplements might help protect against cancer. However, newer findings from clinical studies indicate that taking antioxidant pills does not offer protection against cancer, and may even do some harm. On the other hand, eating lots of food rich in antioxidants, such as green vegetables, citrus fruits, deep-orange colored produce as well as other types of fruits and vegetables has been shown to be protective.
- **Myth:** Antioxidant supplements prevent heart disease.
- **Fact:** Several clinical studies have shown no benefit in taking antioxidant pills to prevent heart disease. Most of the research thus far, however, has been on people who already have heart disease. Several studies have looked at antioxidants, especially vitamin E, and have found no protective effect against heart disease (and may even increase the risk of heart failure). The results from clinical studies do not support antioxidant supplement use.
- **Myth:** Osteoporosis can be prevented by taking calcium supplements.
- **Fact:** Many factors contribute to the development of osteoporosis, one of which is calcium. Estrogen levels, exercise, gender, body size, smoking, race and heredity are all important aspects that relate to osteoporosis. The most effective treatment in postmenopausal women may be a combination of extra calcium, vitamin D, exercise and estrogen. While calcium consumption from foods such as milk and yogurt is the best way to meet daily needs, a daily calcium supplement can be beneficial if intakes of calcium are below the recommended levels.
- **Myth:** Vitamin B-15 (pangamic acid), vitamin B-17 (laetrile), and vitamin P (bioflavinoids) are new vitamins that prevent disease.
- **Fact:** These are not vitamins and have not been shown to prevent cancer, help athletes' performance or promote health.
- **Myth:** Vitamin B-6 will alleviate PMS (premenstrual syndrome).
- **Fact:** The evidence supporting this is thin. Two studies in 2007 have shown some benefit for reducing symptoms. Many factors are associated with PMS, and one critical factor is the importance of eating well and regularly. High levels of vitamin B-6 intake can also lead to temporary nerve damage in the arms and legs.

How are dietary supplements regulated?

It is important to understand, that while supplements can come in pill and capsule form, they are regulated as a food rather than a drug. This means, that unlike drugs, supplements do not need FDA approval before being sold to the public.

In 1994, Congress passed the Dietary Supplement Health and Education Act (DSHEA). This act defined a supplement as any product that is taken by mouth and contains some "dietary ingredient" that is meant to add to what is consumed in the diet. These dietary ingredients can include vitamins, minerals, herbs and botanicals, amino acids, enzymes, organ tissues, glandular, and metabolites. It is important to understand, that while supplements can come in pill and capsule form, they are regulated as a food rather than a drug. This means, that unlike drugs, supplements do not need FDA approval before being sold to the public. It is up to the supplement manufacturer to prove that supplements are safe and that there is evidence to support health claims. In 2007 the FDA issued the Current Good Manufacturing Practices which are intended to insure the identity, purity, strength, and composition of dietary supplements. These rules will be fully put in place by June 2010.

What does this mean for you as the consumer? While the regulation of supplements are improving, this rule does not ensure the safety or effectiveness of ingredients in dietary supplements. It is still important to do some homework before taking a supplement. The following link leads to sites that rate dietary supplements: http://dietarysupplements.info.nih.gov/Health_Information/ODS_Frequently_Asked_Questions.aspx.

Learn about what you take before you take it. Knowledge is the best protection.

Can supplements be dangerous?

Taken in high amounts, some supplements may produce undesirable effects such as fatigue, diarrhea and hair loss.

Large doses of either single-nutrient supplements or high potency vitamin-mineral combinations may be harmful. These megavitamins may contain 10 to over 100 times the Dietary Reference Intake (DRI) for a vitamin or mineral and can act like drugs with potentially serious results.

Taken in high amounts, some supplements may produce undesirable effects such as fatigue, diarrhea and hair loss.

Others may cause more severe side effects such as kidney stones, liver or nerve damage, birth defects, or even death. At high levels, single-nutrient supplements function as a drug in the body and not as a nutrient.

Fat-soluble vitamins such as vitamins A and D are harmful in high doses. For non-smokers, supplements of Vitamin A should contain the majority of the vitamin in the beta-carotene rather than the retinol form. Vitamin E can act as a blood thinner and should not be taken for at least one week prior to surgery. Water-soluble vitamins have commonly been thought to be harmless. Recent research, however, shows that vitamin B-6, a water-soluble vitamin, can cause nerve damage at the high doses prescribed for PMS. High intakes of folic acid can mask or worsen the symptoms associated with a vitamin B-12 deficiency. Large amounts of vitamin C can cause diarrhea and nausea.

Many factors influence toxicity. Supplement potency, dose (number and frequency), body size and how long the supplement is taken all influence whether a supplement can be toxic.

- **Myth:** There is no harm in taking supplements; after all, they contain the same nutrients as in foods.
- **Fact:** Very high doses of many vitamins such as A, C, D and B-6, as well as several minerals, can cause serious health problems if taken regularly. Excesses of one nutrient may cause nutritional imbalances or increase the need for other nutrients.

Can supplements interact with drugs?

Zinc can decrease the absorption and effectivenss of the drug penicillamine, used in the treatment of rheumatoid arthritis.

Some supplements interfere with the action of medications, creating a variety of ill effects. Vitamin E acts as a blood thinner and when taken with the prescription medication Coumadin, can increase the risk for internal bleeding. On the other hand, high levels of vitamin K can decrease the effectiveness of Coumadin. Calcium can decrease the absorption of bisphophonates (for treating osteoporosis), antiboiotics in the fluorouinolone and tetracycline classes, and several other drugs. Zinc can decrease the absorption and effectivenss of the drug penicillamine, used in the treatment of rheumatoid arthritis. Supplements can also interact with drugs and cause adverse events during surgery. These are just a few of the vitamin-drug interactions which can occur, it is important to tell your physician and pharmacist if you are taking any type of dietary supplement. For additional information on nutrient-drug interactions, please see our Nutrient-Drug Interactions and Food fact sheet 9.361.

Who needs supplements?

National food consumption data and dietary surveys show that the majority of Americans get the nutrients they need through food alone. Some nutrients, like calcium and iron, may require careful food selection but can be obtained from adequate amounts of foods.

Certain individuals have special needs and may benefit from taking a supplement. They include the following:

- People with limited food intake, such as chronic dieters and some elderly, have difficulty meeting their nutrient needs.
- Older adults may benefits from supplements of B-12, vitamin D, and calcium.

Individuals with certain diseases or physiological conditions may require supplementation.

- Iron supplementation may be important for women of childbearing age, pregnant women, and teenage girls. Post-menopausal women and adult men are not likely to be iron deficient and therefore do not need iron supplementation.
- Some vegetarians, especially strict vegans who eat no meat, dairy products or eggs, may not receive adequate amounts of iron, calcium, zinc and vitamin B-12.
- Infants and children who receive less than 1 quart per day of vitamin D fortified formula or milk. Adolescents who consume less than 400 IU/day of vitamin D.
- Women who are trying to or may become pregnant have additional folate needs of 400 µg/day.
- Individuals with dark skin or who do not get enough sunlight, may not make sufficient amounts of vitamin D from sun exposure, and could benefit from a supplement.
- Individuals with certain diseases or physiological conditions may require supplementation.
- Newborn infants are given vitamin K to help their blood clot.
- Pregnant or breastfeeding women require higher levels of many nutrients, especially folacin, iron and calcium. Adequate folate is particularly important before pregnancy and during the first trimester to prevent neural tube defects. The addition of folic acid to grains and cereals helps to increase the amount of folate people can obtain from foods.

Individual recommendations for supplementation should come from a physician or a registered dietitian. If you have a special need for calcium or iron and are taking it in pill form, see the following.

Calcium

Calcium from food is better absorbed and used than calcium from pills. The best food sources of calcium are low-fat milk, cheese, yogurt, and canned fish with edible bones such as sardines and salmon.

To estimate the absorbability of calcium tablets or multivitamins that contain calcium, place the tablet in 6 ounces of vinegar for 30 minutes. If it disintegrates, the calcium in the pill can be effectively absorbed by your body.

Check the label to see if the supplement meets disintegration standards of the U.S. Pharmacopoeia (USP), which establishes quality standards for drugs and health care products. For the best quality, choose brand names or large chain-store brands. Avoid tablets containing bone meal or dolomite, which may be contaminated with lead.

Calcium is best absorbed in several doses, rather than all at once. The most popular calcium supplement, calcium carbonate, contains more calcium per tablet than calcium lactate, calcium gluconate or calcium citrate. Be sure to take calcium carbonate with meals because stomach acids help calcium absorption. Chewable tablets are fairly inexpensive sources of calcium.

Calcium from food is better absorbed and used than calcium from pills. The best food sources of calcium are low-fat milk, cheese, yogurt, and canned fish with edible bones such as sardines and salmon. Tofu, some dry beans, tortillas made with lime-processed cornmeal, and dark green leafy vegetables like broccoli, kale and collards also provide calcium. Spinach is high in oxalates and its calcium is not absorbed well.

Iron

The most common iron supplement is ferrous sulfate, although other ferrous salts such as ferrous lactate, fumarate, glycine sulfate, glutamate and gluconate are also absorbed well. Ferrous succinate may have a 30 percent higher absorption rate than ferrous sulfate.

If you take iron tablets on an empty stomach, you get the best absorption but you also may experience constipation, diarrhea or stomach upset, depending on the dosage. Taking iron supplements with meals reduces iron absorption by up to one-third.

Vitamin C aids iron absorption whether the iron comes from food or a pill. Try meal combinations such as orange juice and iron-fortified cereal or salsa and bean burritos. Other good food sources of iron are meat, dried apricots, and iron-fortified bread. Keep supplements out of the reach of children. Eating iron-containing drugs is the most common cause of poisoning deaths in young children.

Zinc

The most common iron supplement is ferrous sulfate, although other ferrous salts such as ferrous lactate, fumarate, glycine sulfate, glutamate and gluconate are also absorbed well.

The effects of zinc supplements on duration and severity of the common cold is still controversial. While several studies have demonstrated that zinc lozenges, nasal spray, or nasal gel can have benefits, an equal number of studies have demonstrated no effect from zinc supplementation on the common cold. Additionally, there may be some question as to which form of zinc is most effective. In general, it is unclear whether taking extra zinc will provide benefits agaist the common cold. It is important to note that there is some question about zinc supplementation leading to loss of smell and possibly contributing to a copper deficiency.

People Who Need Supplements

The suggestion to buy nutrition insurance in pill form is appealing, but advertising is deceptive. Advertisers list all the terrible things that can happen if the diet is lacking, but never that vitamin deficiency is rare unless a person's diet is extremely unbalanced and lacks variety. Most important, they never tell how to measure whether or not the diet is adequate. If they did, they'd lose customers.

Determining dietary adequacy actually is quite easy. People can get an adequate amount of all essential nutrients by eating a variety of foods they enjoy and can afford. Eating well need not be expensive and should be pleasurable.

- **Myth:** People under emotional stress need "stress" vitamins.
- **Fact:** Emotional stress does not increase nutrient needs. In fact, some companies have been required to stop advertising their products as stress vitamins. Unfortunately, other companies continue to make these false claims. Physiological stress, such as burns, trauma and surgery, do increase nutrient needs, and a supplement may be prescribed.
- **Myth:** Those who smoke or drink in excess should take vitamin pills to protect their body from the harmful effects of smoking and drinking.
- **Fact:** Smoking does increase the body's need for vitamin C, and alcohol can interfere with the body's ability to use several nutrients. However, taking additional vitamins and minerals will not protect people from the harmful effects of smoking or alcohol abuse.
- **Myth:** Competitive athletes and others who exercise regularly should take extra vitamins and minerals.
- **Fact:** Athletes and fitness buffs are less likely to need supplements than anyone! When a person eats more calories to meet increased demands, the small amount of extra nutrients needed are easily supplied.

How to Choose a Supplement

Healthy people who take supplements should limit supplement potency to 100 percent or less of the Dietary Reference Intake (DRI) for their age and gender. Avoid supplements that provide megadoses of any vitamins or minerals or have added botanicals whose properties are unknown. Information about vitamin and mineral content and forms can be found on the label of all dietary supplements. Be careful of misleading claims that promise the product is a "cure all" or can treat or cure a disease. Follow the old adage "If something looks too good to be true, it probably is." The term natural on a supplement is not synonymous with safe. Several natural products can have drug interactions, worsen certain health conditions, and can be harmful at higher doses. Do not take a supplement in place of getting advice from a physician or taking prescription medications. Before taking a dietary supplement, consider whether the supplement is necessary and whether there are dietary modifications that might be a better option.

For more information on how to spot a false health claim see the following website put out by the Federal Trade Commission (FTC), www.ftc.gov/bcp/edu/pubs/consumer/health/hea07.shtm.

For information on recent supplement alerts and safety information put out by the FDA got to http://www.fda.gov/Food/DietarySupplements/Alerts/default.htm.

Taking Supplements

Self-prescribed high dosages of supplements can be potentially dangerous and cannot guarantee good health.

- **Myth:** Taking supplements is an inexpensive way to ensure good health.
- **Fact:** The most cost-effective way to promote good health is to exercise regularly and eat a wide selection of foods.

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